APOILO GAN Specification

Original Issue Date: Release Authority: TDUN 31026 Class A Release

POST-INSTALLATION CHECKENT SPECIFICATION

FOR LM GAN SYSTEM

Record of Bevisions

Date	Revision Letter	Ho.	Pages Sertend -	APPROVALS	
				AC.	MASA
11/22/56	1	32056	1-63 Was 83 pages, now 10 pages.	EA	WLS
12/29/6	_ B	32480	6-46,51,62,67,73,74,78 FOLIA-	JP	
2/27/67	0	33084	5-86	EA	
4/17/61	D	33613	3, 6, 7, 16, 17, 18, 22, 23, 28, 35,		
			44, 45, 64, 79, 65 ROG/RC	EA	WLS
7/27/07	E	34218	3, 5-7, 9-12, 14, 16-86; was 86 pages	EA	-
_		-	now 04 pages.	000	
11/2/67	3. #	25010	- 0-94; was 94 pages, now 95 pages		-
LABAS	5 0	35420	lay contract	T.A.	
2/21/65	H	35774	3,5,6,11-14,17-21,24,25, 28-95; was so pages, now 100 pages, 25-75	EA	WLS
			10, 11-100, was 100 pages per 104		

This appetitiontism complete of page 1 to 165 inclusive

Paragraph No.	Test Title
	Standby Power In Test
	Alarms and Interrupts Test
	IMU Operate Power On Test
	Temperature Control Verification
	- PGNCS Power Supply Test
	IMU Operational Test
DARKET IN	PGNCS Operational Test
	IMIC Scale Pactor Test *
	DHU Performance Test *
	LGC Voltage Margin Test
4.3.11	LGC Clock Prequency Tent
	Gimbal Friction Test
6.5.13	Stabilization Loop Response Tout
	GEN Pine Alignment Test
	AOT Functional Performance Test.

To be performed periodically every stirty days.

OMN TREETS

REGISTED 1

6.2.4.10 CAUTION: LGC OPERATE AND IMU STANDBY power must have been applied a minimum of two hours before energizing the IMU OPERATE circuit breaker in step 6.2.4.18 tribes all of the following conditions are met:

- IF: 1. The GES System has previously been in Standby Modu at least two hours and subsequently been in Overnir Mode. AND
  - The globals were placed in a parked position prior to shutdown, AND
  - The shutdown period did not exceed 5 days; AND.
  - 4. The Spacecraft or IMU have not been moved in any war during the shutdown period.

THEN: The two-hour standby Mode operation requirement is reduced to 15 minutes.

a. 2.4.22 On the CRT, seen the power supply voltages to verify their normal operation. (No indications finabling).

8.2.4.23 After all the feats of 5.3 in Figure 1 have been completed, the General Turn-On Procedure (6.2.4) and IMU Operational Test (6.3.5) shall be completed before re-running any test. Otherwise, the testing sequence shall continue to accordance with Figure 2.

### 5.2.5 Interruption of Power

6.2.5.1 IMU Operate power shall never be applied without the presence of LGC Operate and IMU Standby Power.

6.2.5.2 The G&N System log book shall include the gimbal positions at time of power shutdown. If omitted, it shall be assumed that the gimbals were not parked prior to shuldown. The log book shall also state if any movement of the IMU or Spacecraft has taken place after shutdown. The times of application and removal of any bus power to the G&N System shall be recorded.

6.2.5.3 After the system has been operating with IMU Operate power os, and a power interruption occurs, immediately set the IMU Operate power circuit breaker to OFF. When power is restored a minimum of 15 minutes operation in Standby Mode is required before resuming IMU Operate power. If the power interruption was longer than 15 minutes, the GeN System shall be run in Standby Mode for a time interval at least equal to the duration power was off before resuming IMU Operate power. However, this period need not exceed two hours before application of IMU Operate power.

6.2.6 A warmup period of at least one hour in Operate mode is required prior to performing any test in which gyro or accelerometer parameters are measured, and at least 15 minutes prior to any test in which precision amplitude and frequency power supply checks are made.

#### 6'2 LEST MINGEDOURS

5.3.1 Standby Power On Tests

5.3.1.1 The Portable Temperature Controller, Model No. 400-31058 shall be supplying thertial component heater power to the GAN System through connector 5631 (P230). If alarm or fall indications are present on the PTC. they shall be cleared by depressing the SYSTEM RESET pushbutten on the PTC.

6.3.1.2 Verify that spacecraft power checks, including both polarity as well as magnitude on the spacecraft power connectors, have been accomplished.

APOLLO GAN Specification Specializa BKV I 8. 3. 1. 6. 2 Lamp Test

6.3.1.6.2.1 Initiate the Lamp Test by entering in the DSKY

VERB 35 ENTR

6, 3, 1, 6, 2, 2 The following DSKY displays shall illuminate for appreximately 5 seconds. On CAUTTON/WARNING panel, the following displays shall illuminate, thes extlagoists:

LGC

- B. UP LINK ACTY
- IL NO ATT
- G. STBY
- d. KEY BEL flashing
- e. TEME
- (, GEMEAL LOCK
- E PROG
- HESTART
- L TRACKE
- , OPR ERROR Flushing
- k. VERB-NOUN Flashing
- Plus 88888 in Row I.
   Row 2. and Row 3

8te remain in the VERR NOUN display

19th remain in DSKY Row 1. 2 and 3 display

6, 3, 1, n, 3 Uplink Check

6.3.1.6.3.1 On K-START 148; set LOAD/INHIBIT switch to LOAD, set TAPE/KEY switch to KEY, then enter the following:

ERROR RESET VERB 25 NOUN 01 ENTR 92400 ENTR +01234 ENTR -S6789 ENTR

6, 3, 1, 6, 2, 2 Verify the following is displayed on the DSKY,

VERB 23 NOUN 0

R1 = 01234

RD > MITSI

11.7 × 100000

6. 3. 1. 6. 4 Downlink Check

6.3.1.6.4.1 On CRT, DSKY display, verify the following is displayed:

VERB 23 NOUN 01

R1 = 01234

R2 - 56788

EC3 = 00000

6:3.1.5.5 LGC Self-Check

8.3.1.6.5.1 On K-148 enter the following sequence:

I. ERROR HEET

I. VERB 36 ENTR

VEIUF21 NOUN 01 ENTI

L 01362 EN

5. 00000 ENTR ENT

3. 01365 ENTE

T. 00000 ICNTI

NOUN IS ENTE

O DODGE ENTREST

0. 00000 ENTRENTR

1. 00000 ENTH

12. Verify REDG Counter = #00000

VERB 21 NOUN 27 ENTB

14. 00010 ENTE

VERB 15 NOUN 01 ENTR

16. 01366 ENTS

5.3.1.5.5.2 On the CRT, DSKY display, verify that Ri does not display 01102 or 41102. If a malfametica occurs, the following is displayed:

R1 01102 or 01102

Ry XXXXX c (S FAIL) program address +1 of point of failure

III XXXXX minuter of fails,

5.3.1.6.3.2 When H2 = 60003, when the LCC bell Clinick by entering in K-14s the following:

VERD 21 MOUN 27 ESTE

E. S. 1. E. 6 LCC Standy Clavel

A. T. Y. E. G. T. Chi. K. 148. easter the hillowing securior

VICES 21 NOUS 17 ENTS

Start ACE Countdown clock upon depressing ENTR from an initial setting of 5 HRS, it MIN. o SEC. Record difference between LGC time on the CRT and the Countdown clock.

VERB 60 ENTR Verify on CRT ABL-LGC-STRY is ON

5.3.1.5.5.2 On DSKY depress FRO pushbutton for approximately 2 seconds.

S. J. L. S. S. J. Verilly STBY status indicator lamp is ON.

H. I. I. S. E. 4 Of the CHT, verify the 3.2 KC 28V Supply (GG1331) is between 28.04 and 29.16V JONS.

6.5.1, 5.5, 5 On DSKY depress PRO pushbutton for approximately 2 seconds to return to LGC OPERATE mode. If the LGC does not return to the OPERATE mode, depress the PRO pushbutton for a maximum of two additional times.

APOLLO GIN Specification ND10002223 INV J

6.3.1.6.6.6 Verify STHY states indication has in CFF. RESTART hight may be GR. verify LGC WARNING OFF. Press ERROS RESET pushbutton. Enter VERIS 67 ANTR on Keller. Verify on CRT ABL-LGC-STHY in CFF. Record LGC time on the CRT and sime displayed on the countdown clock simultaneously. Verify that the difference between the LGC time and countdown clock is within one second of the difference recorded to 3.3.7.0 May 1.

8. 3. 1. 6. 7. 1 On K-148 enter the following:

VERB 11 NOUN 16 ENTR

8.3.1.6.7.2 On the DEKY press and hold the PRO pusibutton. Varify Row 1 of the DEKY displays 57171.

6, 3, 2 Alarma and Interrupts Test

6, 2, 2, 1 Parity Pall Test

8. 5. 2. 1. 1 40a K-148 enter the following sequence

VERB 21 NOUN C2 ENTR 01000 ENTR ENTR

S. S. J. J. T. Cin CHT. DESCY display, vscify B1 - 35777 and R1 - 91690.

6, 3, 2, 1, 3 On K-148 enter the following sequence

VERB IS NOUN 26 ENTR 04000 ENTR 01600 ENTR 00003 ENTR VERB IO ENTR

8.3.2.1.4 Verily RESTART lamp is ON.

5.3.2.1.5 On K-148 enter VERR 36 ENTR. Press EBROR BESET manhatton, All slarms shall older.

6. 3. 2. 2 Rupt Lock-Interrupt Too Long

6.3.2.2.1 On K-148 moter the fallowing sequence

VERB 24 NOUN OF ENTR 01600 ENTR 01600 ENTR VERB 25 NOUN 26 ENTR (000) ENTR 01600 ENTR 01600 ENTR VERB 21 ENTR 5.3. Z.Z. Z. Vertily RESTART Lamp to OK.

G. 3. Z.Z. 3 On M-148 enter VERB 25 ENTR. Press ERROR RESET pushbutton. All storms shall oleur.

S. S. 2. S TC Trap Test

6.3.2.3.) On K-148 enter the following sequence

VERB 21 NOUN BLENTR 01600 ENTR 01600 ENTR VERB 25 NOUN 26 ENTR 04000 ENTR 01600 ENTR 00003 ENTR VERB 30 ENTR

6.3.2.3.2 Verify RESTART lump is GN.

8.3.2.3.3 On E-148 enter VERB 36 ENTR. Press ERROR RESET (MARCHARDO. All Marries shall clear.

8.3,2,4 Nightwaichman Test

B. S. 2. 4. 1 On K-148 enter the following sequence

VEHB 34 NOUN OF ENTRE 01600 ENTR 01600 ENTR VERB 25 NOUN BE ENTH 03400 ENTR 01600 ENTR 00003 ENTR

6.3.2.4.2 Verily RESTART lamp is ON-

6.3.2.4.3 On K-148 enter VERB 36 ENTR. Press ERHOR RESET pushbutton. All sistems shall clear.

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APOLLO GAN Specification

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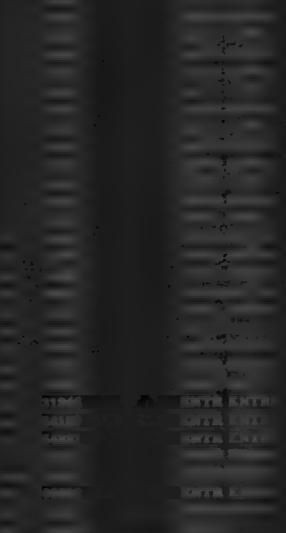
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## FOR LM GAN SYSTEM

# Record of Revision

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APOLLO GAR specification

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A Phenomenh C. C. C. C. S. L. au follows:

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Addition 11: Revise Paragraph 6.3, 10.2,7 to read as follows:

0. 3, 10. 2. 7 On PSAAM, set INHIBIT VOLTAGE FAIL switch ON.
On DSKY enter the following:

VERB 21	NOUN 10	ENTR
00077		ENTR
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		RSET

Verify RESTART light is OFF.

Addition 13: Add Paragraph 6, 3, 10, 2, 9, 1 as follows:

8. 3. 10. 2. 9. 1 On K=148 enter the following sequence:

VERB	0.1		ENTR
00077			ENTR

Verify DSKY Row 1 display has bit 6 on. Other combinations of bits are permissible but bit 6 must be on.

Addition 14: Revise Paragraph 6, 3, 10, 2, 10 to read as follows:

6. 5. 10. 2. 10 On PSAAM, set INHIBIT VOLTAGE FAIL switch ON.
On DSKY enter the following:

VERB 21	NOUN 10	ENTR
00077		
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fortig that RESTART light to OFF.

Addition 15: Add Paragraph 5, 3, 10, 2, 14, 1 as follows:

6, 3, 10, 2, 14, 4 On K-148 enter the following sequence

VERH 01 NOUN 10 ENTR 00077 ENTR

Verify DSKY Raw I display has his hose. Other combins— Sons of bits are permissible but his 6 minst be one. Addition 16: Revise Paragraph 5, 3, 10, 2, 15 to read as follows

6. 3. 10. 2. 15 On PSAAM, set INHIBIT VOLTAGE FAIL switch ON.
On DSKY enter the following.

VERB 21	NOUN 10	ENTR
		ENTR
		ENTR
		RSET

Vertily that RESTART light in OFF.

Addition 17 Add Paragraph 6, 3, 10, 2, 17, 1 as follows:

. B. 3, 10, Z. 17, 1 On K-145 enter the fallowing sequence:

VIRD 01 NOUNTS	
	ENTR

Territy DSKY flow 1 display has bit 6 on. Other combina-

Addition 18. Review Program 6 3.10.2 Is to read as follows:

10. 10. 1 SAND OF BRITT VOLTAGE FAIL switch ON.

NOUN 10	ENTR
	ENTR

Verily that RESTAIRT light is OFF.

Add Parngraph 0, 3, 11, 16, 1 as follows:

6. 3. 11. 15. 1 On K-148 enter the following sequence if the RESTART long came on in above step.

VERB	NOUNTO	
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APOLLO GEN Specification ND1002323 REV R Original Issue Date: Release Authority: TDRR Class A Balease

# POST-DISTALLATION CHECKOUT SPECIFICATION

## FOR IM GAN STREET

Revisions of Revisions

Servicion TO	TORR		Ap	Approvals	
Date	LAMBET		The second second	NOT	NASA
11/2588	~ [~]	27683	T, 24, 35, 80, 76, 61 Total No.	EA	WIS
	4		Dages HIN THE CONTRACTOR	<u> </u>	
3/27/69	.14	37452	14, 20-22, 43-103, WXE 105	EA	RJJ
(a)	41	4.50	pages, now 100 pages, 17/1/16		1
6/15/65	*	37,620	20-63	EA	-
11/6/69	P	37917	54-109. Was 109 pages;	EA	MDH
			now 114. 90/AC		
11/25/65	R	37984	28 1865	EA	MDH

This specification consists of page 1 to 11+ inclusive.

APPROVALS	W.S. Swingle		H. D. Perryk D. A. Zhomer J. E. Phresis
	NASA/MSC	MIT/IL	AC 9/21/EE

APOLLO GEN Specification ND1002323 REV S Original leave Date: Release Authority: TDER Class A. Release

### POST-INSTALLATION CHECKOUT SPECIFICATION

### FOR LM GAN SYSTEM

Record of Revisions

	Data	Revision	TDRR	A PRINCIPAL OF	Approvals	
	Date	Letter	No.	Revised	35"	MASA
P	11/27/68	T,	57063	7, 24, 35, 60, 76, 81, Total Mo.	TA	6-5-
				pupus now 104.		
	./27/69	M	37452	14, 20-22, 43-105, Was 105	-	100
		-C	- Z	pages, now 100 osers.		
9	6/18/69	N	37620	20-08 WA+1/1C	EA	
P	11/6/69	. p	37912	54 - 109, Was 109 pages;	EA	MDH
	1		E PART	now 114. 10/AC		
ù	11/25/69	R	37984	26	EA	MDH
	3/13/70	S.	38077	14, 23, 24, 29, 31, 94-96, 109, 110,	EA	MDH

This specification consists of page 1 to 114 inclusive.

ADDOGUATE	W.S. Swingle		R.D. Petryk
AFFEOVALD	NASA/MSC	MIT/IL	AC 9/33/66